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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,982	09/23/2003	Steven Rosenau	10021114-1	8191
57299	7590	05/19/2006	EXAMINER	
AVAGO TECHNOLOGIES, LTD. P.O. BOX 1920 DENVER, CO 80201-1920			NORRIS, JEREMY C	
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			2841	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/669,982	Applicant(s) ROSENAU ET AL.	
	Examiner Jeremy C. Norris	Art Unit 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/24</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-5, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,762,367 (Audet) in view of US 2002/0044423 A1 (Primavera) and US 6,962,829 B2 (Glenn).

Audet discloses, referring primarily to figure 1A, a circuit having vias disposed to minimize discontinuity in a ground plane separating opposing transmission lines, said circuit comprising: a first type of electrical connection array (col. 6, lines 45-60) disposed on a first surface of said circuit, and electrically coupled to a first transmission line; a second type of electrical connection (col. 7, lines 5-25) disposed on a second surface of said circuit, and electrically coupled to a second transmission line wherein said second type of electrical connection have a higher areal density than said first type of electrical connection, and vias (20, 22, 24) disposed proximate said first type of electrical connection and extending through a ground plane (col. 6, lines 15-45) to provide for electrically coupling said first transmission line and said second transmission line, such that said vias minimize discontinuity in said ground plane. Audet does not specifically state that the circuit is flexible. Instead, Audet generically states that the circuit may comprise a plastic substance (see col. 6, lines 5-15). It is well known in the art to use flexible polyimide as the material for a plastic substrate as evidenced by Primavera (see [0046]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use flexible polyimide as the substrate in the invention of Audet. The motivation for doing so would have been to provide an inexpensive and reliable package of an IC chip (see [0009]). Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the

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intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. Also, the modified invention of Audet does not specifically state that the electrical connections are pads [claim 1]. Instead the modified invention of Audet generically teaches that any means of electrical contact can be used (Audet col. 6, lines 50-55). It is well known in the art to use pads to electrically connect substrates and electrical components as evidenced by Glenn (figures 16, 17). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use pads as the electrical contact in the modified invention of Audet as is known in the art and evidenced by Glenn. The motivation for doing so would have been to provide a means for reliable electromechanical connection.

Additionally, the modified invention of Audet teaches, wherein said first type of electrical connection pads are flip-chip pads (Glenn, figure 17) [claim 2], wherein said first type of electrical pads are wirebond bond pads (Glenn figure 16) [claim 3], wherein at least one of said plurality of vias is coincident with one of said plurality of wirebond bond pads (Audet figure 1A) [claim 4], wherein at least one of said plurality of vias is coincident with one of said plurality of flip-chip pads (Audet fig. 1A) [claim 5], wherein said first type of electrical connection pads are configured for coupling an integrated circuit (14) thereto [claim 8], wherein said second type of electrical connection pads are a ball grid array (16) or pin grid array [claim 10].

Claims 11, 12, 14, 16, 17-19, 21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn in view of Primavera.

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Glenn discloses, an electrical connection assembly having vias (14) disposed to combine electrical discontinuity, said electrical connection assembly comprising; a circuit comprising a ground plane (200) separating a first surface and a second opposing surface, said first surface having a first transmission line (22) coupled thereto and said second surface having a second transmission line (26) coupled thereto; a via (14) closest to a first region of electrical connection pads (23) configured to receive a wirebond (40) and offset from connectors (27) on said second opposing surface, said via electrically coupling said first transmission line and said second transmission line wherein said wirebond generates electrical discontinuity and said via generates electrical discontinuity and wherein said via is proximate said first region of electrical connection pads for combining said electrical discontinuity caused by said wirebond and said electrical discontinuity caused by said via. Glenn does not specifically state that the circuit is flexible [claim 11]. Instead, Glenn generically states that the circuit may comprise a laminate (see col. 5, lines 25-30). It is well known in the art to use flexible polyimide as the material for a laminate circuit as evidenced by Primavera (see [0046]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use flexible polyimide as the circuit in the invention of Glenn. The motivation for doing so would have been to provide an inexpensive and reliable package of an IC chip (see [0009]). Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In similar fashion, the modified invention of Glenn teaches, wherein said first region of electrical connection pads comprises at least one via capture pad (22) [claim 12], further comprising a second region of electrical connection pads (27) comprising a ball grid array (28) or pin grid array [claim 14], wherein said first region of electrical connection pads has an areal density (see figure 18A) less than a second region (27) of electrical connection pads (see figure 18C) [claim 16], wherein said first region of electrical connection pads are a linear array of pads (see figure 18A) [claim 17].

Regarding claim 18, Glenn discloses a circuit assembly having vias (14) disposed proximate a plurality of bond pads (23) to minimize electrical discontinuity in said circuit assembly, said circuit assembly comprising: a circuit comprising a first surface and a second opposing surface separated by a ground plane (200), said first surface having a first conductive layer (22) coupled thereto and said second surface having a second conductive layer coupled thereto; said plurality of bond pads coupled to said first conductive layer and configured to receive a wirebond (40) electrical connection, said bond pads offset from connectors on said second surface; electrical connection pads (27) coupled to said second conductive layer (26) configured to electrically couple an external electrical assembly to said second conductive layer (see col. 5, lines 65-68); and vias (14) closest to said plurality of bond pads, said vias enabling electrical coupling of said first conductive layer and said second conductive layer, said vias disposed to minimize discontinuity in said circuit assembly. Glenn does not specifically state that the circuit is flexible [claim 18]. Instead, Glenn generically

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states that the circuit may comprise a laminate (see col. 5, lines 25-30). It is well known in the art to use flexible polyimide as the material for a laminate circuit as evidenced by Primavera (see [0046]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use flexible polyimide as the circuit in the invention of Glenn. The motivation for doing so would have been to provide an inexpensive and reliable package of an IC chip (see [0009]). Moreover, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Also, the modified invention of Glenn teaches wherein said plurality of bond pads are via capture pads [claim 19], wherein at least one of said vias shares one of said plurality of bond pads (see fig. 16) [claim 21], wherein said plurality of bond pads are disposed with an areal density less than said connection pads (see figs. 18A & C) [claim 23].

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Audet in view of Glenn and Primavera as applied to claim 1, and further in view of US 6,396,712 (Kuijk).

The modified invention of Audet discloses the claimed invention as described above except the modified invention of Audet does not specifically state that the first type of electrical connection pads is configured for coupling an optical module thereto [claims 15, 20]. Instead, the modified invention generically states that the component is

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an integrated circuit (see col. 6, lines 1-10). However, it is well known in the art to use optical integrated circuits chips as evidenced by Kuijk (see col. 4, lines 25-45).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use an optical IC as the IC chip in the modified invention of Audet as is well known in the art and evidenced by Kuijk. The motivation for doing so would have been to allow the device to process electronic and optical signals thus making the device more flexible.

Claims 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn in view of Primavera as applied to claims 11 and 18 above, and further in view of US 6,396,712 (Kuijk).

Glenn in view of Primavera discloses the claimed invention as described above except the modified invention of Glenn does not specifically state that the first type of electrical connection pads is configured for coupling an optical module thereto [claims 15, 20]. Instead, the modified invention generically states that the component is an integrated circuit (see col. 6, lines 25-30). However, it is well known in the art to use optical integrated circuits chips as evidenced by Kuijk (see col. 4, lines 25-45). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use an optical IC as the IC chip in the modified invention of Glenn as is well known in the art and evidenced by Kuijk. The motivation for doing so would have been to allow the device to process electronic and optical signals thus making the device more flexible.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Audet in view of Glenn and Primavera as applied to claims 4 and 5, 12, and 21 above, and further in view of US 2002/0139566 A1 (Strandberg).

The modified invention of Audet teaches the claimed invention as described above except the modified invention of Audet does not specifically state that the pads are substantially teardrop shaped [claims 6, 7]. However, it is well known in the art to use teardrop shaped pads in electronic devices as evidenced by Strandberg (see [0037]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to shape the pads of the modified invention of Audet in teardrop shape as is known in the art and evidenced by Strandberg. The motivation for doing so would have been to use pads with a smaller footprint to allow for more dense signal wiring. Moreover, it has been held that more than a mere change of form is necessary for patentability. *Span-Deck, Inc v. Fab-con, Inc.* (CA 8, 1982) 215 USPQ 835.

Claims 13 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn in view of Primavera as applied to claims 12 and 21 above, and further in view of US 2002/0139566 A1 (Strandberg).

The modified invention of Glenn teaches the claimed invention as described above except the modified invention of Glenn does not specifically state that the pads are substantially teardrop shaped [claims 6, 7, 13, 22]. However, it is well known in the art to use teardrop shaped pads in electronic devices as evidenced by Strandberg (see

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[0037]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to shape the pads of the modified invention of Glenn in teardrop shape as is known in the art and evidenced by Strandberg. The motivation for doing so would have been to use pads with a smaller footprint to allow for more dense signal wiring. Moreover, it has been held that more than a mere change of form is necessary for patentability. *Span-Deck, Inc v. Fab-con, Inc.* (CA 8, 1982) 215 USPQ 835.

Response to Arguments

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 1 March 2006, regarding claims 11-23 have been fully considered but they are not persuasive. Applicants allege Glenn "fails to teach or suggest 'said first type of electrical pad array is offset from said second type of electrical pad array' as claimed in Independent Claims 1, 11, and 18". However, the Examiner notes that this particular limitation is not recited in independent claims 11 and 18. Thus, Applicants are arguing limitations not stated in the claims. Moreover, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Thus the traversal of the rejection on these grounds is deemed unsuccessful.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCSN



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